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NEW PHYTOPHAGOUS HYMENOPTERA FROM THE TERTIARY OF FLORISSANT, COLORADO.

By Charles T. Brues.

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No. 10. — *New Phytophagous Hymenoptera from the Tertiary of Florissant, Colorado.* By Charles T. Brues.

Over a year ago I received from the Museum of Comparative Zoölogy the large collection of undetermined fossil phytophagous and parasitic Hymenoptera collected many years ago by Dr. S. H. Scudder in the Tertiary lake basin at Florissant, Colorado. Since then a large number of additional parasitica have been received from the same locality from Prof. T. D. A. Cockerell, who has been collecting there for the past two summers.

The present paper contains a consideration of the phytophagous forms belonging to the Tenthredinidae, Lydidae, and Siricidae. These are very much less numerous than the parasitic ones.

Three genera and twelve species are described as new, and reference has been made to the more definite records of occurrence of members of the group in the various Tertiary formations of Europe and North America, the only continents where they have been discovered.

A catalogue of the recorded species and genera is also included.

The figures are reproduced from drawings made with the aid of a camera lucida.

TENTHREDINIDAE.

Trichiosomites, gen. nov.

Radial cell of front wings long, not appendiculate; divided at its basal third by a transverse nervure. Submedian cell only a little longer than the median. Anal cell divided into cells connected by a petiole, much as in Pachyprotasis or Hemichroa. Basal vein and first recurrent nervure almost parallel, the second transverse cubitus and the second recurrent nervure interstitial.

The long marginal cell and interstitial second recurrent nervure remind one of Trichiosoma, as does also the oval abdomen. There are such important differences, however, that I feel compelled to erect a new genus for the reception of the single species, which I cannot place in any described genus. The long marginal cell is similar to that of Paremphytus.[1]

[1] Since this paper went to press Mr. S. A. Rohwer of the University of Colorado writes me that he has identified the same species in material from Florissant, which shows that the genus is closely related to Zarea Leach. The antennae are six-jointed.

Trichiosomites obliviosus, sp. nov.

Length 9 mm. Body broad and stout, the width of the abdomen being 3 mm. Color apparently black, with more or less brownish on the abdomen. Wings hyaline, the veins dark. Head rounded on the sides, its surface finely shagreened; mesonotum more coarsely so or finely punctulate. Scutellum smooth. Metanotum more or less rugose. All of the abdominal segments are of nearly equal length, the fifth widest, one and one-half times as wide as the first. Abdomen in outline regularly oval. Marginal cell in front wings very long and narrow, pointed, but not at all appendiculate, divided by a cross-vein at its basal third.

Fig. 1. — *Trichiosomites obliviosus* Brues. Fore-wing.

Humeral area divided by a cross-vein near the origin of the basal vein; submedian cell longer than the median by one-third the length of the transverse median nervure. Basal vein and first recurrent nervure almost parallel. First and second submarginal cells not separated, the second recurrent nervure interstitial with the second transverse cubitus. Anal cell as in Pachyprotasis, divided into two by the fusion of the anterior and posterior nervures; the petiole thus formed as long as the distance from the fusion to the transverse median nervure.

Type. — No. 2036, Mus. Comp. Zoöl., Florissant, Col. (No. 1381, S. H. Scudder Coll.).

Phenacoperga Cockerell.

The type species and only one so far made known is *P. coloradensis* Ckll., from Florissant. It was first described in the genus Perga (Cockerell, : **07**[a]), but later made the type of Phenacoperga by its author (**:08**).

Lophyrus Latreille.

Brischke (**'86**) records the occurrence of Lophyrus in Prussian amber, but the genus has not been found fossil elsewhere.

Hemichroa Stephens.

A single species, *H. eophila* Ckll., has been described from Florissant by Professor Cockerell (**: 06**), who refers it to this genus without any doubt. There are no specimens in the collections which I have seen.

Dineura Dahlbom.

Cockerell (: 06) has already recognized a species of this genus from Florissant to which he gives the name *Dineura saxorum*, and there is a second one in the present collection. The two may be separated as follows:

Transverse median nervure received much before the middle of the first discoidal cell; second recurrent nervure inserted a considerable distance before the tip of the second submarginal cell . . . . . *saxorum* Ckll.

Transverse median nervure received just at or a trifle before the middle of the first discoidal cell; second recurrent nervure inserted at the extreme tip of the second submarginal cell . . . . . *laminarum*, sp. nov.

Dineura laminarum, sp. nov.

Probably a female. Length 10 mm. Head and thorax very dark and abdomen pale, except at the tip, where it is brownish. Head rather small and narrow. Antennae black, very gradually attenuated toward the tip, reaching as far back as the base of the metanotum. The mesonotum is brown, with a narrow black border anteriorly, and shades into black behind. Scutellum black. Sides of the metanotum apparently pale like the abdomen. Legs, especially the posterior pair, distinctly preserved, apparently brown; tibiae and tarsi of the hind pair

Fig. 2. — *Dineura laminarum* Brues. Wings.

darker above. Wings hyaline, the veins fuscous or piceous. Humeral cross-vein inserted a short distance before the origin of the basal vein; transverse median nervure inserted just before the middle of the first discoidal cell. Marginal cell long and pointed, its cross-vein distinct. First submarginal cell quadrate, the first transverse cubitus and the first section of the cubitus subequal, second section a trifle longer. Second recurrent nervure inserted at the apex of the second submarginal cell, being almost interstitial with the second transverse cubitus. Anal cell with a long petiole. Recurrent nervure in hind wing inserted three-fifths of the way from the base of the second submarginal cell.

Type. — No. 2037, Mus. Comp. Zoöl., Florissant, Col. (No. 4983, S. H. Scudder Coll.).

This species approaches the genus Mesoneura in the disposition of the recurrent nervures in both pairs of wings, the second being almost interstitial with the second transverse cubitus. This character apparently tends to vary, however, as the vein is more nearly interstitial in one wing than in the other.

It is a broad, stout species.

Pteronus prodigus, sp. nov.

Sex? Length about 7 mm., most of the head broken away. Color dark, varied with paler. The anterior part of the mesonotum and the prothorax are yellowish, while the scutellum and metathorax are darker. The mesonotum has an anterior triangular dark spot and dark lateral margins. Abdomen pale, banded on each segment with fuscous. The bands of the first and second segments reach only half-way across; the following grow wider to the sixth, and the seventh is again narrower. Wings hyaline, the venation as in Pteronus. Humeral field divided by a cross-vein opposite the base of the first discoidal cell. Marginal cell long and lanceolate, not divided. First submarginal cell small, obliquely rounded above, the first and second sections of the cubitus equal. Second sub-

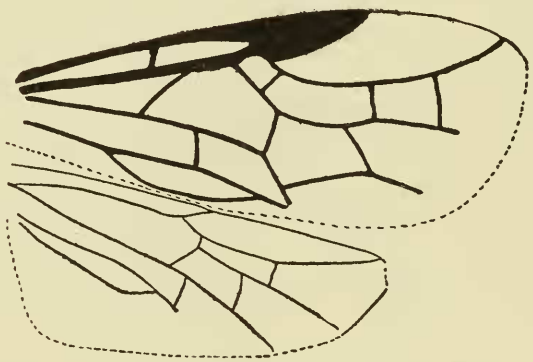

Fig. 3. — *Pteronus prodigus* Brues. Wings.

marginal cell very long, over three times as long as the second section of the cubitus, receiving the two recurrent nervures. Third submarginal cell distinctly longer than high, and higher at the tip than at the base. Anal cell petiolate, its petiole originating just basad to the lower end of the basal nervure. Hind wings with the first discoidal and first submarginal cell separate.

Type. — No. 2038, Mus. Comp. Zoöl., Florissant, Col. (No. 14,071, S. H. Scudder Coll.). It is in a fine state of preservation, showing both front and hind wings, but lacking a part of the head.

The venation in this species is exactly like that of recent species, and the color markings are disposed with a similar tendency to those of *P. ribesii* Scop. and *P. mendicus* Walsh, two common North American species of recent times.

Serres in his Géognosie ('29) has referred a fossil species from Aix to this genus, but it is very doubtfully a member of Pteronus, as the genus is at present restricted.

Scolioneura vexabilis, sp. nov.

Length 9 mm. Broad and stout, dark colored or black with paler markings. Abdomen ferruginous except at the base and apex. Dorsum of thorax indistinctly pale around the edges. Antennae preserved only near the base, black; the joints toward the base about five or six times as long as wide. Thorax as wide as long, and not quite so wide as the oval abdomen, which is twice as long as wide. Wings indistinctly infuscated towards the base, the veins brown. Anal cell lanceolate, petiolate, as wide at its broadest part as three-fourths of the length

FIG. 4. — *Scolioneura vexabilis* Brues. Fore-wing.

of the transverse median nervure. Marginal cell long and narrow, pointed at apex; apparently not divided by a nervure. First submarginal cell small, more or less rounded at its base; second and third long, each receiving a recurrent nervure; basal vein and first recurrent nervure widely divergent behind.

Type. — No. 2039, Mus. Comp. Zoöl., Florissant, Col. (No. 1520, S. H. Scudder Coll.).

This species might perhaps be excluded from Scolioneura, as I cannot make out any cross-vein in the marginal cell. I can find no other suitable place, however, and think that it may best be left here. The hind wings are not well enough preserved to show their venation, but the front ones are in good condition, with the exception of a part of the apical portion.

Selandria LEACH.

Brischke ('86) mentions the occurrence of a single specimen belonging to Selandria in Baltic amber. Curtis ('29) compares a form from the lower Oligocene at Aix with *Selandria fuliginosa*, but the latter is evidently the *Tenthredo fuliginosa* now placed in Tomostethus Konow.

Eriocampa HARTIG.

Cockerell (: 06) has described *Eriocampa wheeleri* from Florissant, and there is a second species to be added from the Scudder collection. The two may be separated as follows:

Second submarginal cell on the radius more than twice as long as the first submarginal on the cubital side; cross-vein in marginal cell strongly oblique; wings infuscated . . . . . *scudderi*, sp. nov.

Second submarginal cell on the radial side no longer than the first submarginal on the cubital side. Wings hyaline . . . . . *wheeleri* Ckll.

Eriocampa scudderi, sp. nov.

Length about 9 mm. Body seemingly wholly black, with infuscated wings. Nervures piceous. Hind legs, or at least the femora and tibiae, black. Marginal cell long and pointed, the cross-vein strongly oblique, inserted much nearer to the tip than to the base of the second submarginal cell. First submarginal cell small, narrowed at the tip, the first transverse cubitus being only two-thirds the length of the first section of the cubitus. Second submarginal cell long and narrow,

Fig. 5. — *Eriocampa scudderi* Brues. Fore-wing and a small portion of hind-wing.

over three times as long as high at the tip. Basal vein and cubitus arising at the same point, the basal vein longer than the oblique apical side of the first discoidal cell. Anal cell with a moderately oblique cross-vein; rather weakly constricted behind basally, but the nervure is strongly thickened at the constriction.

Type. — No. 2040, Mus. Comp. Zoöl., Florissant, Col. (No. 8298, S. H. Scudder Coll.), very nicely preserved except for the hind wings and the antennae.

Eriocampa, sp.

There is a specimen (No. 2041, Mus. Comp. Zoöl.; No. 9101, S. H. Scudder Coll.), which is not well enough preserved to place positively in this genus, but which probably represents a third species. The wings are brown and the body pale, except the posterior margin of the thorax and the last two or three abdominal segments, which are dark or black. It is quite a strikingly colored species.

Emphytus Klug.

This genus is said to be represented in Baltic Amber by Menge (**'56**).

Paremphytus, gen. nov.

Similar to Emphytus, but the basal nervure and the first recurrent nervure are widely divergent, not parallel as in that genus. The submedian cell is much longer than the median, and the first transverse cubitus absent. Anal cell divided by an oblique nervure; not constricted behind toward the base. Marginal cell very long and unusually narrow beyond the cross-vein; rounded at the tip but not appendiculate. First and second submarginal cells each receiving

a recurrent nervure. Antennae stout and thick, and possibly with the last joint long, as in Arge and its allies. However, this character is not very plainly to be seen on the specimen.

I have not been able to locate this specimen with any degree of satisfaction. The similarity of the antennae to those of Arge *et al.* is very striking, but it is possible that the last joint is in reality several closely united ones. From these forms it differs at once by the non-appendiculate marginal cell and the divided anal cell. The absence of the first transverse cubitus reminds one of Emphytus, but the position of the first recurrent nervure is entirely different.

Paremphytus ostentus, sp. nov.

Female. Length 9 mm. Elongate, black, with indications of brownish bands on the abdomen. Head very small, considerably narrower than the thorax and about one-half as thick as wide. Abdomen with nearly parallel sides; obtusely rounded at the tip where the terebra projects quite distinctly. Wings distinctly infuscated, especially on the apical half. Marginal cell long, divided, gradually narrowed to the tip, which is rounded but not appendiculate. First submarginal

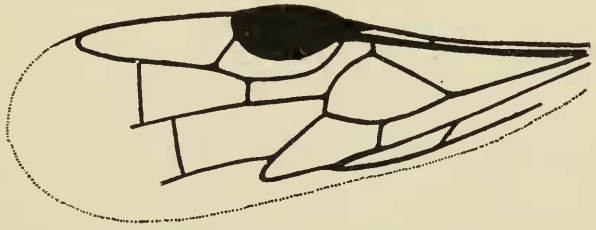

Fig. 6. — *Paremphytus ostentus* Brues. Fore-wing.

cell very long, as long as the second along the radial nervure; second submarginal strongly widened, so that the second transverse cubitus is twice as long as the first. Submedian cell much longer than the median, the basal nervure and the transverse median vein separated on the median vein by a distance almost as great as the length of the basal nervure. Anal cell with an oblique cross-vein.

Type. — No. 2042, Mus. Comp. Zoöl., Florissant, Col. (No. 11,586, S. H. Scudder Coll.).

Pseudosiobla Ashmead.

Cockerell ('07) has described a single species from Florissant. There are none in the material at hand.

Taxonus Hartig.

Two species of Tertiary saw-flies have been referred to this genus. According to Konow, the well-known authority on the classification of these insects, the species described by Heer ('47) as *Tenthredo vetusta* from the lower Miocene at Radoboj is referable to *Taxonus* ('97).

The second species was described by Scudder in his Tertiary Insects ('90) as

Taxonus nortoni from the Green River beds of Wyoming. From his figures (Pl. **10**, Figs. 26-27) of the wing venation there seems to be no doubt that the generic reference is satisfactory.

Palaeotaxonus, gen. nov.

Body elongate, subparallel; the abdomen long, twice the length of the thorax, all its segments of equal width and of nearly equal length. Wing venation as in Taxonus, but the submedian cell is no longer than the median, the transverse median nervure being interstitial with the basal vein. Anal cell divided by an oblique cross-vein which is nearly as long as the transverse median nervure. Marginal cell long, pointed at the tip, divided by an unusually oblique, curved cross-vein. Second and third submarginal cells each receiving a recurrent nervure near the base.

The present form resembles Taxonus in most respects, but differs very plainly in the interstitial transverse median nervure. This is evidently a primitive trait which is exemplified in several of the other fossil saw-flies here described. On this account I have thought the character to be of generic importance, especially taken in connection with its constancy among large groups of recent Hymenoptera.

Palaeotaxonus typicus, sp. nov.

Length 9.5 mm. Head and thorax black, the abdomen more or less rufous or brownish. Head square behind, rounded toward the front, twice as wide as thick. Antennae of equal thickness for at least the basal two-thirds; black; the joints not very well differentiated in the specimen, but one somewhat beyond the middle is about four times as long as thick. Wings hyaline, humeral area with a cross-vein just basad to the origin of the basal vein, which is close to the origin of the

FIG. 7.—*Palaeotaxonus typicus* Brues. Fore-wing.

cubitus. Basal vein and first recurrent nervure almost parallel, slightly convergent behind. First section of the cubitus twice as long as the first transverse cubitus, which is one-third the length of the second submarginal cell. Third submarginal cell over three times as wide at apex as at base.

Described from two specimens.

Type.—No. 2043, Mus. Comp. Zoöl., Florissant, Col. (No. 11,984, S. H. Scudder Coll.). Also, No. 2044, Mus. Comp. Zoöl., Florissant, Col. (No. 7051, S. H. Scudder Coll.).

Dolerus Jurine.

This abundant North American genus has not been found at Florissant, but it is known to occur in the middle Oligocene at Brunstatt in Alsace, where it was noted by Förster ('91). Schöberlin ('88) has also found it in the upper Miocene in Oeningen.

Macrophya pervetusta, sp. nov.

Length 13 mm. Stout, entirely black, or at least very dark. Head nearly as wide as the thorax, over three times as wide as thick antero-posteriorly, the sides strongly convergent in front. Thorax elongate, twice as long as wide, the metathorax being considerably narrower than the mesothorax. Abdomen nearly as long as the head and thorax together, oval, with six segments clearly defined; rounded broadly at the tip, the extreme apex obscured. Wings hyaline, or perhaps slightly infuscated. Venation typical of the genus, much like that of the recent *M. albicincta*. Marginal cell long, its dividing nervure entering the radius

Fig. 8. — *Macrophya pervetusta* Brues. Fore-wing.

much closer to the second transverse cubitus than to the first; first recurrent nervure received just before the middle of the first submarginal cell; the second near the base of the third. Submedian cell but little longer than the median on the externo-medial nervure. Anal cell constricted in the middle until the cross-vein practically disappears; basally it is not appreciably constricted below.

Type. — No. 2045, Mus. Comp. Zoöl., Florissant, Col. (No. 637, S. H. Scudder Coll.).

The venation and the very elongate hind coxae which project backwards laterally so that their tips extend nearly to the middle of the abdomen, determine the systematic position of the species without any doubt. It resembles the present-day *Lagium atroviolaceum* Norton so greatly in size and color that I was tempted to refer it to Lagium. The antennae are not preserved, so that it seems better to refer it to the larger genus Macrophya in absence of positive evidence to the contrary.

Tenthredo Linné.

Four species of Tenthredo, *sensu stricto*, have been discovered at Florissant, one recently described by Cockerell, and three characterized in the present paper.

Brischke ('86) has recognized a species in Baltic amber which he has not described, and Gravenhorst ('35) also noted the occurrence of the genus in the same formation.

Less exact references have been made to Tenthredo by Schöberlin ('88), two species from Oeningen; Serres ('29) and Heer ('61), species from Aix; and Schlotheim ('29), one from Baltic amber. These last cannot be regarded as generic determinations, and have no especial significance in the present state of our knowledge.

Florissant species of Tenthredo.

1. Anal cell of hind wings sessile with or touching the first apical cell; discoidal cell of front wings very long, its diagonal length much more than twice the length of the basal nervure . . . . . *T. avia*, sp. nov.
   Anal cell of hind wings shorter, not touching the first apical cell, but separated from it by a distinct vein or petiole 2
2. Petiole of anal cell in hind wing over one-half the length of the basal nervure of the front wing, equalling the vein closing the second discoidal cell of hind wing . . . . . *T. infossa*, sp. nov.
   Petiole of anal cell very short, less than one-third the length of the basal nervure 3
3. Length 13 mm. First discoidal cell over four times as long as the basal nervure in the front wing . . . . . *T. submersa* Ckll.
   Length 17 mm. First discoidal cell less than three times as long as the basal nervure . . . . . *T. misera*, sp. nov.

Tenthredo avia, sp. nov.

Female. Length about 13 mm. Body probably variegated with yellow and black. The head is black and the antennae dark. Dorsum of thorax brownish black at the bases of the wings and paler along the parapsidal furrows. Scutellum yellowish; metanotum yellowish, with black reticulations. Median groove of mesonotum very distinct. Abdomen apparently very pale, with a dorsal line of spots, one to each segment; these are small, rounded-quadrate, and diminish in size apically. Wings hyaline, the veins unusually pale in color. Median cell shorter than the submedian by only one-half the length of the transverse median nervure. Third submarginal cell more than twice as high at the apex as at the base. Anal cell not contracted at the insertion of the cross-vein; its sides subparallel, but the posterior side suddenly widens out basally, making the cell more than twice as wide as at the cross-vein. Posterior wing with the anal cell not separated from the first apical cell by a vein.

Type. — No. 2046, Mus. Comp. Zoöl., Florissant, Col. (No. 3763, S. H. Scudder Coll.).

Of the four species from the Florissant shales, this most closely approaches recent representatives of the genus. The preservation of the type is very good, except the sides of the abdomen, which are not distinguishable at first glance. This causes the abdomen to take on a singular subulate appearance quite foreign to its actual form.

Tenthredo infossa, sp. nov.

Length 10.5 mm. Probably a female. Body stout; dark in color. Head black, the thorax more or less light colored anteriorly; the scutellum and metanotum black. Abdomen very dark, narrowly banded with pale on the sutures. Wings hyaline, the veins unusually dark. Antennae black, the apical three joints narrowing; basal joints rather broad, the ones at the beginning of the flagellum three or four times as long as thick. Head small and broad, two and one-half times as wide at the temples as thick antero-posteriorly. Abdomen narrowly oval, twice as long as wide; the extreme apex not preserved, so that the sex cannot be positively determined. Marginal cell moderately long, its cross-vein only slightly curved; first discoidal cell unusually short, hardly more than twice as long diagonally as the length of the basal vein, and more rhombic in

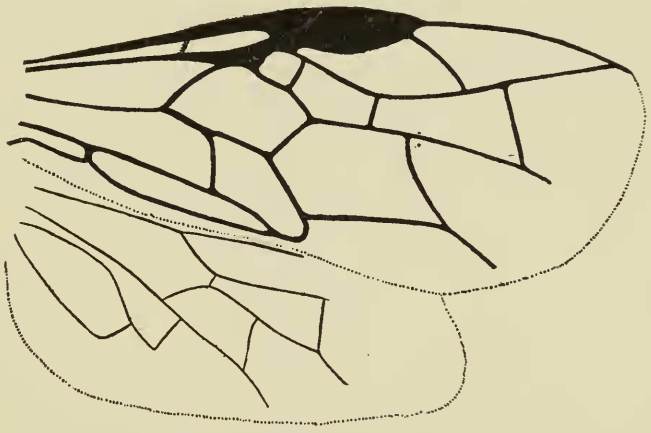

Fig. 9. — *Tenthredo infossa* Brues. Wings.

shape than usual. First submarginal cell quadrate, the first abscissa of the cubitus but little longer than the first transverse cubitus. Submedian cell longer than the median by a little more than the length of the transverse median nervure. Second submarginal cell receiving the recurrent nervure distinctly before the middle. Anal cell slightly constricted at the cross-vein, suddenly widened out behind toward the base to nearly triple its width at the cross-vein. Petiole at apex of anal cell in hind wing as long as the vein closing the second discoidal cell.

Type. — No. 2047, Mus. Comp. Zoöl., Florissant, Col. (No. 11,988, S. H. Scudder Coll.).

One specimen in a fine state of preservation.

This species resembles Macrophya to some extent, more especially on account of the petiolated anal cell of the hind wing, but the form of the anal cell in the front wing is that of Tenthredo. The legs are not at all preserved.

Tenthredo misera, sp. nov.

Female. Length 17 mm. Large and robust; head and thorax dark, probably the head was black and the thorax black, varied more or less with brown. Abdomen pale, very indistinctly indicated in the fossil. Head about two and one-half times as wide as thick. Antennae slender and tapering very gradually to the tip, the joints toward the base of the flagellum three or four times as long as wide. Wings hyaline, the veins rather weak and light in color. Marginal cell long, its cross-vein distinctly arcuate. First submarginal cell considerably narrowed above, the first section of the cubitus being nearly two times as long as the first section of the radius. Second submarginal cell receiving the recurrent nervure at its basal third. Submedian cell longer than the median by somewhat more than the length of the transverse median nervure. First discoidal cell diagonally about two and one-fourth times as long as the basal vein. Anal cell constricted imperceptibly at the cross-vein, and slowly widened basally behind; the cross-vein is distinctly oblique. Petiole at apex of anal cell in hind-wing only one-fourth as long as the vein closing the second discoidal cell.

Type. — No. 2048, Mus. Comp. Zoöl., Florissant, Col. (No. 12,400, S. H. Scudder Coll.).

This is by far the largest species of Tenthredo here described.

LYDIDAE.

Atocus Scudder.

This genus was erected by Scudder (**'92**) for a single species from Florissant. It comes very close to Neurotoma and Pamphilius as defined by Konow (**:05**). The only noteworthy character that separates it is the uniformly decreasing length of the antennal joints, the third, or first flagellar, joint being distinctly longer than the second in recent forms. If this character has been overlooked in figuring the type, it can scarcely be considered distinct from Neurotoma, to which it is more closely related than to Pamphilius (= Liolyda) on account of the absence of the humeral cross-vein.

Electrocephalus Konow.

This genus was proposed by Konow (**'97**) for a single species from Baltic amber. It is related to Janus and Macrocephus.

Cephus Latreille.

An amber species is noted by Menge (**'56**), but no other fossil forms have been described or mentioned so far as I am aware.

Megaxyela petrefacta, sp. nov.

Female. Length probably about 13 mm., the head nearly effaced. Dark in color, with the sutures of the abdomen pale on the sides; these markings are narrow near the base, but occupy the major parts of the several apical segments. Terebra exserted 1½ mm., curved downward to the blunt tip. The abdomen is somewhat cylindrical and slowly narrowed to near the tip, when it suddenly rounds down to the base of the terebra. The head, antennae, thorax, and legs are not well enough preserved for description, but the wings show clearly their venation, although somewhat overlapped in position. The type is very similar to that of *Megaxyela major* Cresson. The first marginal cell, however, lying just beneath the stigma, is nearly twice as long as wide, and the first recurrent nervure

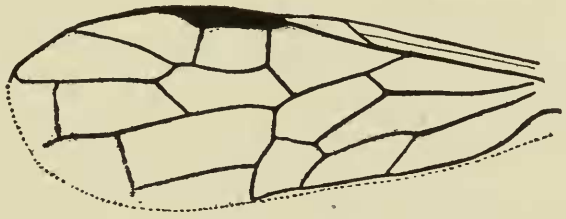

Fig. 10. — *Megaxyela petrefacta* Brues. Fore-wing.

is only two-thirds as long as the vein that meets it to form the tip of the second discoidal cell. Otherwise the venation so far as preserved is scarcely distinguishable from the recent species.

Type. — No. 2049, 2050 (reverse), Mus. Comp. Zoöl., Florissant, Col. (No. 1386, 4295, S. H. Scudder Coll.).

Due to splitting of the rock and subsequent weathering, only the abdomen and wings are preserved, although the entire length can be made out. In venation and size this species is remarkably similar to *M. major* Cresson, from Texas, of which it is undoubtedly a close relative. So far no other recent species have been discovered, and the genus appears to be restricted to the southwestern United States.

SIRICIDAE.

Paururus Konow.

According to Konow (**:05**) the fossil described by Heer as *Urocerites spectabilis* from the lower Miocene of Radoboj belongs to this recent genus, and must be known as *Paururus spectabilis* Heer.

Sirex Linné.

Two species referred to this genus have been recognized in Baltic amber by Klebs (**'89**).

Lithoryssus parvus Brues.

There are three specimens of this species in the present collection (No. 2051–2054, Mus. Comp. Zoöl., Florissant, Col., No. 5080, 5110 (reverse), 5522, and 14,045, S. H. Scudder Coll.), none of them so perfectly preserved as the type, however, which is in the American Museum of Natural History. In one the wings are better preserved, and I find that the humeral area is divided by a cross-vein just before the origin of the basal nervure, and not "apparently undivided," as stated in the original description of the species (:06). In size they are all larger than the type, 4–5 mm., but seem otherwise identical.

Cephites Heer.

Two species, *C. oeningensis* and *C. fragilis* Heer, have been placed in this genus by Heer ('47), who considers them to be related to Cephus and Xiphydria.[1]

The front wings have two radial cells, the first under but extending beyond the stigma; the first submarginal cell is large, seven-sided, and touches the stigma; second longer and narrower; those beyond, if any, obliterated. Two discoidal cells, the first distinct and moderately large, rhomboidal; the following (third) open apically where the neuration becomes obsolete. Humeral area narrow but distinct. Basal cell wider, the transverse median nervure present.

From this diagnosis it will be seen that Cephites approaches Lithoryssus in many respects, and in view of the fact that such close relationship prevails between many of the Florissant and Oeningen types, it is not unlikely that the two may be quite similar. I have therefore placed the European form near Lithoryssus, tentatively at least.

[1] Konow ('97) believes that these are Neuroptera, but Handlirsch (:07) does not agree with him, and thinks that they have been correctly placed by Heer. Not having had access to any specimens, and thus compelled to rely on Heer's figures, I have merely pointed out the resemblance which they apparently show to the American Lithoryssus.

CATALOGUE OF TERTIARY PHYTOPHAGA.

Tenthredinidae.

Trichiosomites obliviosus Brues.
Bull. M. C. Z., 1908, **51**, p. 260.
Miocene; Florissant, Colorado.

Cimbex (larva) Menge.
Progr. petrischule Danzig, 1856, p. 24.
Lower Oligocene; Baltic Amber.

Phenacoperga coloradensis Ckll.
Science, 1907, n. s., **26**, p. 446 (*Perga*); *idem*, 1908, **27**, p. 113.
Miocene; Florissant, Colorado.

Lophyrus, sp. Brischke.
Schrift. naturf. gesellsch. Danzig, 1886, n. f., **6**, p. 279.
Lower Oligocene; Baltic Amber.

Hemichroa eophila Ckll.
Bull. Amer. mus. nat. hist., 1906, **22**, p. 501.
Miocene; Florissant, Colorado.

Dineura saxorum Ckll.
Bull. Amer. mus. nat. hist., 1906, **22**, p. 499.
Miocene; Florissant, Colorado.

Dineura laminarum Brues.
Bull. M. C. Z., 1908, **51**, p. 261.
Miocene; Florissant, Colorado.

Pteronus, sp. Serres.
Géogn. terrains tert., 1829, p. 229.
Lower Oligocene; Aix, France.

Pteronus prodigus Brues.
Bull. M. C. Z., 1908, **51**, p. 262.
Miocene; Florissant, Colorado.

Scolioneura vexabilis Brues.
Bull. M. C. Z., 1908, **51**, p. 263.
Miocene; Florissant, Colorado.

Selandria, sp. Brischke.
Schrift. naturf. gesellsch. Danzig, n. f., 1886, **6**, p. 279.
Lower Oligocene; Baltic Amber.

Selandria (*Tenthredo*), sp. Curtis.
Edinburgh new philos. journ., 1829, **7**, p. 295.
Lower Oligocene; Aix, France.

Eriocampa wheeleri Ckll.
Bull. Amer. mus. nat. hist., 1906, **22**, p. 500.
Miocene; Florissant, Colorado.

Eriocampa scudderi Brues.
Bull. M. C. Z., 1908, **51**, p. 264.
Miocene; Florissant, Colorado.

Emphytus, sp. Menge.
Progr. petrischule Danzig, 1856, p. 24.
Lower Oligocene; Baltic Amber.

Paremphytus ostentus Brues.
Bull. M. C. Z., 1908, **51**, p. 265.
Miocene; Florissant, Colorado.

Pseudosiobla megoura Ckll.
Bull. Amer. mus. nat. hist., 1907, **23**, p. 612.
Miocene; Florissant, Colorado.

Taxonus nortoni Scudder.
Tert. ins. N. Amer., 1890, p. 604.
Oligocene; Green River, Wyoming.

Taxonus vetustus Heer.
Insectenf. tertiärg. Oeningen, 1849, **2**, p. 172 (*Tenthredo*).
Konow, Ent. nachr., 1897, **23**, p. 36 (Taxonus).
Upper Miocene; Oeningen.

Palaeotaxonus typicus Brues.
Bull. M. C. Z., 1908, **51**, p. 266.
Miocene; Florissant, Colorado.

Dolerus, sp. Schöberlin.
Soc. entom., 1888, **3**, p. 61.
Upper Miocene; Oeningen.

Dolerus tenax Förster.
Abh. geol. spezialk. Els., 1891, p. 453.
Middle Oligocene; Brunstatt, Alsace.

Macrophya pervetusta Brues.
Bull. M. C. Z., 1908, **51**, p. 267.
Miocene; Florissant, Colorado.

Tenthredo, sp. Serres.[1]
Géogn. terrains tert., 1829, p. 229.
Lower Oligocene; Aix, France.

[1] Compared with *T viridis* L., which is now referred to the genus Rhogogastera Konow.

Tenthredo, sp. Schlotheim.
Petrefactenkunde, 1820, p. 43.
Lower Oligocene ; Baltic Amber.
Tenthredo, sp. Gravenhorst.
Uebers. schles. gesellsch. vaterl. cult., 1835, p. 92.
Lower Oligocene ; Baltic Amber.
Tenthredo, sp. Brischke.
Schrift. naturf. gesellsch. Danzig., 1886, n. f., **6**, p. 279.
Lower Oligocene ; Baltic Amber.
Tenthredo, sp. Schöberlin.
Soc. entom., 1888, **3**, p. 61.
Upper Miocene ; Oeningen (two species).

Tenthredo gervaisi Heer.
Saporta, Rech. climat. pays tert., 1861, p. 153.
Lower Oligocene ; Aix, France.
Tenthredo submersa Ckll.
Bull. Amer. mus. nat. hist., 1907, **23**, p. 613.
Tenthredo avia Brues.
Bull. M. C. Z., 1908, **51**, p. 268.
Miocene ; Florissant, Colorado.
Tenthredo infossa Brues.
Bull. M. C. Z., 1908, **51**, p. 269.
Miocene ; Florissant, Colorado.
Tenthredo misera Brues.
Bull. M. C. Z., 1908, **51**, p. 270.
Miocene ; Florissant, Colorado.

Lydidae.

Atocus defessus Scudder.
Bull. 93, U. S. G. S., 1892, p. 24, pl. 11, f. 5.
Cockerell, Science, 1907, n. s., **27**, p. 113.
Miocene ; Florissant, Colorado.
Pamphilius, sp. (larva) Menge.
Progr. petrischule Danzig, 1856, p. 24.
Lower Oligocene ; Baltic Amber.

Electrocephalus strahlendorffi Konow.
Ent. nachr., 1897, **23**, p. 37.
Lower Oligocene; Baltic Amber.
Cephus, sp. Menge.
Progr. petrischule Danzig, 1856, p. 24.
Lower Oligocene ; Baltic Amber.
Megaxyela petrefacta Brues.
Bull. M. C. Z., 1908, **51**, p. 271.
Miocene ; Florissant, Colorado.

Siricidae.

Paururus spectabilis Heer.
Neue denkschr. schweitz. gesellsch., 1867, **22**, p. 38.
Lower Miocene ; Radoboj.
Sirex, 2 spp. Klebs.
Tagbl. naturforschervers., 1889, **62**, p. 269.
Lower Oligocene ; Baltic Amber.
Lithoryssus parvus Brues.
Bull. Amer. mus. nat. hist., 1906, **22**, p. 492. fig. 1.
Miocene ; Florissant, Colorado.

Cephites fragilis Heer.
Insektenf. tertiärg. Oeningen, 1849, **2**, p. 174.
Upper Miocene ; Oeningen.
Cephites oeningensis Heer.
Insektenf. tertiärg. Oeningen, 1849, **2**, p. 173.
Upper Miocene ; Oeningen.

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